

TITLE: EXPOSURE TO AIR POLLUTION DURING PREGNANCY AND ANTHROPOMETRIC MEASURES AT BIRTH IN FOUR COHORTS IN SPAIN

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Background and Aims:

A growing body of research has found associations between prenatal exposure to air pollution and adverse birth outcomes. The aim is to assess the association between exposure to traffic-related air pollution during pregnancy and anthropometric measures at birth in the Spanish INMA cohorts in Asturias, Gipuzkoa, Sabadell, and Valencia.

Methods:

Exposure to ambient nitrogen dioxide (NO₂) and benzene was estimated combining spatial modeling (land use regression) and temporal correction for a total of 2337 pregnant women's residence for each trimester and the whole pregnancy. Outcomes included birth weight, length, and head circumference adjusted by gestational age and sex. The association between air pollution exposure and birth outcomes was assessed with linear regression models controlled for potential confounders. We also examined the shape of the relationship using generalized additive models. We performed sensitivity analyses for the subset of women who spent ≥15 hr/day at home during pregnancy. Finally, we performed a combined analysis with meta-analysis techniques.

Results:

No significant improvement in the model was obtained with non-linear models. In the combined analysis, an increase of 10 µg/m³ in NO₂ exposure during pregnancy was associated with a significant (at 95% confidence level) reduction in birth length near 1 mm. For the subset of women who spent ≥15 hr/day at home, the change in birth length was twice that. A nearly significant reduction in birth weight of 22 grams was found for the same NO₂ increase in the second trimester. We observed no significant relationship between benzene levels and birth outcomes.

Conclusions:

Residential NO₂ exposure during pregnancy was associated with reductions in size at birth. This association was clearer for the subset of women who spent more time at home.

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